

American Society for Testing Materials BULLETIN

ISSUED



BI MONTHLY

April, 1929

*Thirty-Second Annual
Meeting*



CHALFONTE-HADDON HALL
ATLANTIC CITY, N. J.



JUNE 24-28, 1929



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American Society for Testing Materials



BULLETIN

ENGINEERS' CLUB BUILDING

1315 SPRUCE STREET

PHILADELPHIA, PA.

NUMBER 38

APRIL 30, 1929

Annual Meeting, June 24-28

THE Provisional Program of the Thirty-second Annual Meeting of the Society, to be held at Chalfonte-Haddon Hall, Atlantic City, N. J., accompanies this BULLETIN. It is replete with many valuable reports and papers, the total number of items exceeding that of any previous annual meeting.

The General Opening Session will be held on Tuesday afternoon at 2 o'clock. Immediately following this, two simultaneous technical sessions will be convened at 3 P. M. In all, five pairs of simultaneous sessions will be held, with the General Opening Session and the closing session on Cement and Concrete, and a session on Tuesday evening devoted to the holding of a Symposium on Cast Iron, as single sessions. In addition, one session devoted exclusively to the Edgar Marburg Lecture and the Award of the Charles B. Dudley Medal has been arranged for Wednesday afternoon and one session devoted to the Presidential Address and the report of the Executive Committee will be held on Wednesday evening. There will be 15 sessions in all. Monday, the opening day of the annual meeting, will be reserved for committee meetings, as well as Tuesday morning and Thursday afternoon. The annual Golf and Tennis tournaments will be held on Friday afternoon.

Technical Features

A few of the major features of the program are indicated below:

Mineral Aggregates.—With the assistance of a special committee advisory to the Committee on Papers and Publications two interesting sessions are contemplated devoted exclusively to a Symposium on Mineral Aggregates. Twelve papers are being prepared covering the various uses of mineral aggregates and discussing the several properties of aggregates that are of importance, and it is anticipated that these papers will bring forth considerable discussion indicating the extent of available knowledge on mineral aggregates and what phases require further research.

Cast Iron Symposium.—Similarly, a group of brief papers has been prepared to stimulate discussion in a Symposium on Physical Properties of Cast Iron. These papers have also been secured through the cooperation of a special com-

mittee advisory to the Papers Committee. They are ten in number and cover individually the several properties of cast iron that are of importance. Special reference will be made to high-strength or alloy cast iron.

Non-Ferrous Metals.—An unusually strong program is offered in the non-ferrous metals field. This, of course, is an ever expanding field with new alloys constantly being developed and it is but natural for more papers to be included on the programs for the annual meetings of the Society. In the present instance two entire sessions are devoted to the presentation of these papers and the reports of the Society's committees. Special mention should be made of papers dealing with tests on copper alloy sheet materials and to papers in the aluminum alloy field.

Corrosion and Corrosion-Fatigue.—Important contributions are again presented in the fields of corrosion, fatigue and corrosion-fatigue of metals. These consist not only in the presentation of papers but also of the important reports of the Society's committees. The subject of inhibitors of corrosion will be continued.

Cement and Concrete.—The fields of cement and concrete are again well covered in the reports and papers scheduled, and the closing session is devoted exclusively to their presentation.

Preprints

The usual plan of distributing preprints will again be followed. Under this plan the members will receive in advance of the meeting only those committee reports and papers which they have requested the Secretary-Treasurer to forward. All members attending the annual meeting will receive as they register a complete set of preprints of reports

To secure PREPRINTS of reports and papers, use the enclosed REQUEST BLANK.

and papers.

A request blank for preprints is enclosed on which the reports and papers are listed. A brief abstract of most of the reports and papers has been included in the Provisional Program, which should be of assistance to the members in making a selection of the items which they will wish to secure. A member wishing to obtain preprints should indicate on the blank those which he desires and should forward the signed blank promptly to the Secretary-Treasurer. The

(Continued on page 2)

Annual Meeting

(Continued from page 1)

preprints requested will then be forwarded as they become available, the first installment being placed in the mails late in May. A second installment will be mailed about the middle of June and a third during or after the annual meeting.

A prompt return of these request blanks will greatly facilitate the distribution of preprints. **Preprints will not be mailed to members unless requested.**

Hotel Reservations

Hotel reservations should be made promptly. With the Provisional Program at hand the members can no doubt determine their plans if they expect to be in attendance at only a limited number of sessions, and can make their hotel reservations accordingly. Members are requested to use the enclosed return blank addressed to the hotel management in making reservations.

Chalfonte-Haddon Hall is operated exclusively on the American plan. The special rates that have been made available to the members and their guests, and which will prevail a few days before and after the meeting, are repeated on the reservation blank as announced in the March BULLETIN. The rates vary according to location of rooms and accommodations provided, and the typical floor plans reproduced on the blank should be consulted.

The Chalfonte and Haddon Hall each has its own dining room service so that members who wish to take their meals together regularly should be sure to secure reservations in the same hotel. Members may at times and by arrangement in advance take their meals in either dining room, but obviously this can be done only to a limited extent.

Reduced Railroad Rates

Transportation has been arranged with all passenger associations excepting the Canadian Passenger Associations on the identification certificate plan of reduced fares. Round trip tickets will be sold at one and one-half single fare with return limit of about July 4, and one and three-fifths single fare with return limit of 30 days from date of sale. These reductions apply to members of the Society and dependent members of their families. The certificates necessary to purchase the reduced tickets and further information regarding the reduced rates will be mailed to the members late in May.

Registration at Annual Meeting

Members planning to attend the meeting are requested to fill out and mail promptly the accompanying card addressed to the Society. This will facilitate registration at the meeting. Members should arrange for the registration of ladies in their party promptly upon their arrival. Each lady registered will receive a convention pin and two tickets, each good at any station of the Shill Rolling Chair Co. for one double rolling chair for one hour.

A registration fee of \$1.00 will be charged all members and guests at the meeting with the exception of ladies.

The annual golf and tennis tournaments will be held on Friday afternoon. These tournaments and other entertainment features, such as the informal dance and smoker to be held on Wednesday evening, are in the hands of a special Entertainment Committee, and further announcement concerning these other features will be made in due course.

Some Interesting Facts About Membership

On the opposite page are given some interesting statistics comparing Society membership in the nine Census Zones with the population and with some suitable measures of the industrial status of the zones, such as the number of establishments engaged in manufactures and the value of manufactured products. The last four columns of the table show, respectively, the ratios of value of manufactured products to population, membership to population, membership to number of manufacturing establishments and membership to value of products. Since relative figures are the more significant, the ratios are expressed as percentages of Zone I (Middle Atlantic), which in each case has the highest absolute ratio. This zone is therefore 100; Zone II shows 97, 55, 57 and 59 per cent of Zone I for the four ratios; and so on.

It is informative to study these ratios for the nine zones. Thus, Zone III is an extremely close second to Zone I in both population and value of manufactures, having a 99 per cent standing (column 6); but when compared with Zone I on the basis of membership ratios, it stands 54, 73 and 58 per cent (columns 7, 8 and 9 respectively). Due allowance must be made for the fact that the Society has always had its headquarters in Zone I and that, except for 1927, its annual meetings have been held there, so that relative concentration of its membership in that zone is to be expected. Nevertheless, in the light of these figures there are undoubtedly membership possibilities in a zone as predominantly industrial as Zone III.

In columns 6, 7, 8 and 9, the bold-face numbers in parentheses show the relative positions of the nine zones for each of the four ratios. Below the table, the zones are listed in these sequences. One of the several interesting points developed in this analysis is the position of Zone IX (Pacific), which is farthest removed from the center of activities. Standing No. 4 in ratio of value of products to population, it has positions of 4, 6 and 3 in Society membership ratios.

Five-Year Membership Program

This analysis of membership by zones was in part the inspiration of the Five-Year Membership Program announced in the March BULLETIN. Active work has been started in Zone III. Membership extension committees in the Detroit and Chicago districts are practically completed, under the chairmanship, respectively, of Mr. F. O. Clements, General Motors Corp., and Mr. John Brunner, Illinois Steel Co. Surrounding industrial communities will be included in these committees, of which further announcements will be made. Similar committees to cover the Cleveland and Cincinnati districts are planned. Other zones will be similarly developed.

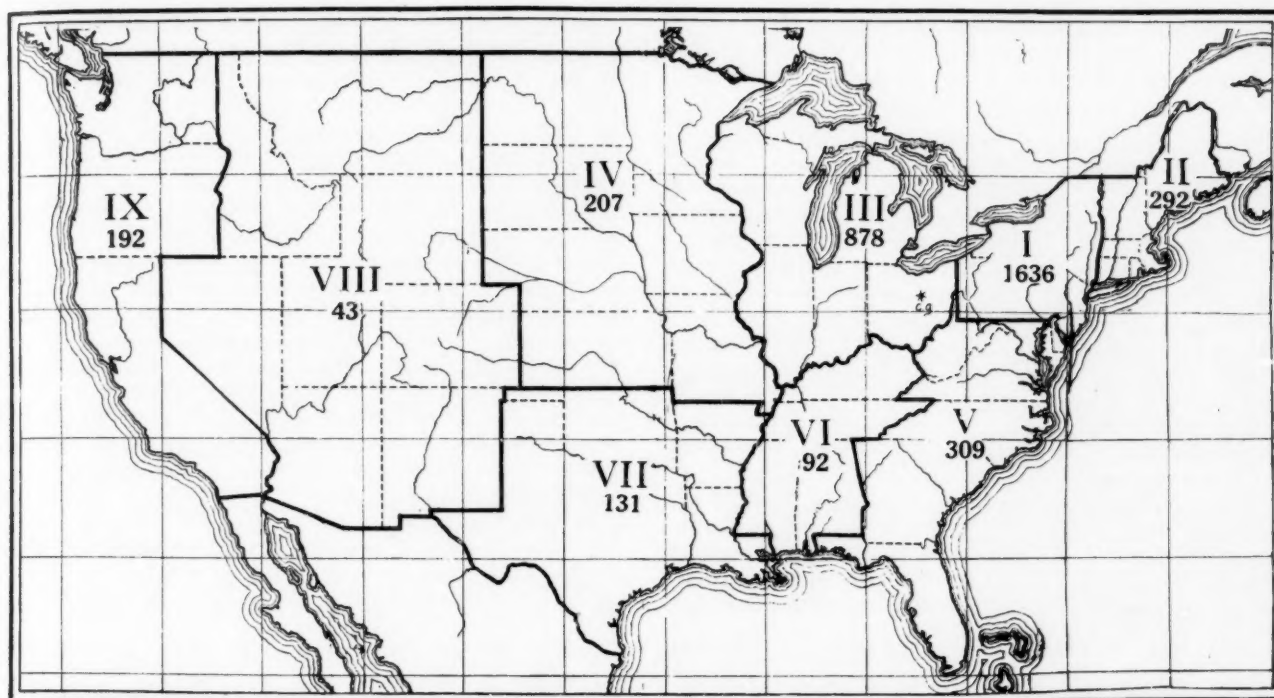
Organization on Pacific Coast.—The formation of district committees in Zone IX is progressing most favorably. While not being organized primarily for membership extension work, this will be an important feature of their activities. Chairmen of three district committees have been appointed by the President, as follows:

Los Angeles District: F. W. Hinrichs, Jr., Professor of Mechanics, California Institute of Technology.

San Francisco District: A. A. Hanks, President, A. A. Hanks, Inc.

Seattle District: I. L. Collier, Assistant Professor of Civil Engineering, University of Washington.

The membership of each committee is practically completed and the committees have held one or more meetings for preliminary discussions. Announcement of the complete personnel of these committees and of their activities will be made in a later issue of the BULLETIN.



A COMPARISON OF A.S.T.M. MEMBERSHIP IN NINE CENSUS ZONES WITH POPULATION AND MANUFACTURING INDUSTRIES.

Zone	Population (1928), thousands (estimated)	Manufactures (1925)		A.S.T.M. Membership, August, 1928	Ratios expressed as percentage of Zone I			
		Number of Establishments	Value of Products, million dollars		Value of Products Population	A.S.T.M. Membership Population	A.S.T.M. Membership Number of Establishments	A.S.T.M. Membership Value of Products
1	2	3	4	5	6	7	8	9
I Middle Atlantic.....	25 225	58 895	19 409	1 636	100 (1)	100 (1)	100 (1)	100 (1)
II New England.....	8 276	18 173	6 161	292	97 (3)	55 (2)	57 (5)	59 (6)
III East North Central.....	24 942	42 888	19 026	878	99 (2)	54 (3)	73 (2)	58 (7)
IV West North Central.....	13 261	16 280	4 724	207	46 (5)	24 (6)	46 (7)	55 (8)
V { District of Columbia.....	552	538	83	87 ^a
South Atlantic.....	15 575	16 038	4 452	222 ^a	36 (6)	30 (5)	67 (3)	85 (2)
VI East South Central.....	9 419	8 080	1 808	92	25 (9)	15 (9)	41 (8)	63 (5)
VII West South Central.....	11 807	7 887	2 546	131	28 (8)	17 (7)	59 (4)	64 (4)
VIII Mountain.....	3 910	3 849	1 046	43	35 (7)	16 (8)	40 (9)	51 (9)
IX Pacific.....	7 045	14 762	3 455	192	64 (4)	42 (4)	47 (6)	70 (3)

^a Total membership of Zone V, 309. District of Columbia not included in statistical analysis in view of its non-industrial character.

NINE MEMBERSHIP ZONES LISTED IN SEQUENCE ACCORDING TO THE FOUR RATIOS, COLUMNS 6 TO 9 ABOVE.

Relative Position	Ratio of Value of Manufactures to Population	Ratio of Membership to Population	Ratio of Membership to Manufacturing Establishments	Ratio of Membership to Value of Manufactures
1.....	I Middle Atlantic	I Middle Atlantic	I Middle Atlantic	I Middle Atlantic
2.....	III East North Central	II New England	III East North Central	V South Atlantic
3.....	II New England	III East North Central	V South Atlantic	IX Pacific
4.....	IX Pacific	IX Pacific	VII West South Central	VII West South Central
5.....	IV West North Central	V South Atlantic	II New England	VI East South Central
6.....	V South Atlantic	IV West North Central	IX Pacific	II New England
7.....	VIII Mountain	VII West South Central	IV West North Central	III East North Central
8.....	VII West South Central	VIII Mountain	VI East South Central	IV West North Central
9.....	VI East South Central	VI East South Central	VIII Mountain	VIII Mountain

AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

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April 30, 1929

A.S.T.M. Membership—What It Means

THE Secretary recently has had occasion to set forth what have impressed him as the four outstanding things that the A.S.T.M. means to its members—outstanding reasons why companies and individuals concerned with engineering materials are and should be affiliated with the Society. He wishes to submit these to the membership, discussing them briefly in several issues of the BULLETIN.

I. Opportunities for Association

The fundamental justification for the existence of a technical society is to provide a means for those engaged in a certain field of human endeavor to associate with each other, to exchange information and ideas, and to unite their efforts towards the advancement of the sciences in their field of common interest. For over a quarter century the American Society for Testing Materials has been performing such a service, bringing together engineer, scientist, manufacturer, consumer, for the two-fold purpose of promoting knowledge of and developing standard specifications and methods of tests for engineering materials. Such materials being necessarily of importance to a greater or less degree in every field of engineering, and their study involving many groups of diversified interests, one of the cardinal principles of the Society perforce has been cooperative effort. Producers and users of materials, technical experts, national societies, trade associations, the Government, all cooperate in the development of its standards, and in the carrying on of its researches. In a very real sense COOPERATION is the keynote of A.S.T.M. activities.

This cooperation is of itself conducive to the promotion of valuable personal associations. The Annual Meeting, the culmination of a year's cooperative effort by the committees, is outstanding as a splendid opportunity for association, with attendant fellowship and exchange of ideas—an invaluable education, broadening in its influence on the individual and, conversely, integrating individual ideas into collective progress in a field that is vital to the advancement of our civilization. Opportunity for association, then, is of first magnitude among the assets of membership.

Enlargement of Executive Committee Proposed

Acting upon suggestions that have been made from time to time by the Nominating Committees of the Society, the Executive Committee will recommend at the coming annual meeting that the number of Members of Executive Committee be increased from eight to ten, under which plan there will be elected each year, to serve for the term of two years, five instead of four Members. In the fifteen years during which the Executive Committee has been constituted in accordance with the present provisions of the By-laws, the activities of the Society have been extended into many new fields. It is not only desirable but important to the success and growth of the Society that all fields of activity be represented from time to time in the Executive Committee. The Nominating Committees have found it increasingly difficult to do this, and the election of five new members each year instead of four provides an opportunity for making the Executive Committee more broadly representative. At the same time the enlargement, from a total of 15 to 17, will not make the Executive Committee in any sense unwieldy but in fact be helpful in the functioning of the Executive Committee.

The necessary amendments to the By-laws involved in this proposal will be submitted at the coming annual meeting.

Dudley Medal Awarded to Kanter and Spring

The third award of the Charles B. Dudley medal, established by the Society for recognition of meritorious papers on research in engineering materials, has been made to J. J. Kanter and L. W. Spring, joint authors of the paper entitled, "‘Long-Time’ or ‘Flow’ Tests of Carbon Steels at Various Temperatures with Particular Reference to Stresses Below the Proportional Limit," presented at the annual meeting of the Society in 1928. The award is made upon the unanimous recommendation of the Medal Committee consisting of W. H. Bassett, chairman, H. E. Smith and W. A. Slater.

Mr. Kanter is testing engineer of the Crane Co. He attended the Armour Institute of Technology and the University of Chicago and has been engaged in metallurgical work at the Chicago plant of the Crane Co. since 1920, having been engaged in the last four years in development of creep test apparatus and in conducting investigations in that field.

Mr. Spring was graduated from the University of Michigan in 1901. He served as chemist with the Illinois Steel Co. and later as chemist with the Crane Co., being in charge of the laboratory from 1906 to 1914, and chief chemist and metallurgist since 1914. He is the author of "Non-Technical Chats on Iron and Steel," and of various articles on chemistry and physical testing.



J. J. KANTER



W. L. SPRING

New Committee on Standards to be Appointed

At its quarterly meeting on April 16 the Executive Committee decided to form a new standing Committee E-10 on Standards. The committee will consist of five members appointed by the Executive Committee with the Secretary-Treasurer acting *ex-officio* as its secretary. The committee will serve in an advisory capacity to the Executive Committee in matters concerning standardization activities and will have in general the following duties and authority:

1. To promote the standardization work of the Society and to consider matters of general policy concerning A.S.T.M. standardization activities, including the relationship of such activities with similar activities of other bodies.

2. To review annually the progress of the Society's standardization work and to consider the desirability of extending that work from time to time into new fields, which might involve an extension of the activities of existing committees or the organization of new committees.

3. To review proposed new tentative standards or amendments of existing tentative standards offered by standing committees between annual meetings of the Society, in accordance with a proposed modification of the Society's standardization procedure looking to the earlier promulgation of proposed standards as A.S.T.M. Tentative Standard.

The new committee, which will function as an administrative committee in the standardization field in much the same way that Committee E-9 on Correlation of Research now functions in the field of research, will unquestionably fill a need that has become increasingly evident with the rapid growth of our standardization activities.

Modification of Standardization Procedure

Acting concurrently with Committee E-5 on Standing Committees, the Executive Committee will propose at the coming annual meeting a modification of the By-laws of the Society and the Regulations Governing Standing Committees whereby standing committees may present reports to the Executive Committee between annual meetings of the Society and proposed new standards or proposed amendments of existing tentative standards contained therein may be reviewed by the new Committee E-10 on Standards and if found satisfactory may then be published as A.S.T.M. Tentative Standard. The review of the proposed new standard by Committee E-10 will determine whether all requirements relating to the preparation and submission of standards have been complied with and whether the standing committee concerned has reached a substantial consensus in its recommendations. It is proposed that two representatives of the standing committee concerned shall serve as members of Committee E-10 during the consideration of or action upon the standing committee's recommendations, with full privileges of discussion and vote. Tentative standards promulgated in the interim between annual meetings will be regularly reported by the committee at the succeeding annual meeting, when they shall be subject to the usual consideration and amendment in accordance with normal procedure.

It will be noted that the proposed new procedure simply makes possible quicker action on acceptance of proposed new standards once the standing committee has completed its work, without as at present withholding action till the next annual meeting. The plan in no way affects the steps now provided for fullest possible consideration of standards in committee nor does it modify in any wise the procedure by which the Society formally adopts A.S.T.M. Standards.

The necessary amendments to the By-laws, together with a more complete discussion of the matter, will be formally submitted at the annual meeting.

Dr. Saul Dushman to be Marburg Lecturer

Will Speak on "The Nature of Cohesive Forces in Solids"

It is with considerable pleasure that we announce the selection of Dr. Saul Dushman, assistant director of the research laboratory of the General Electric Co. at Schenectady, to deliver the fourth Edgar Marburg Lecture at the coming annual meeting on "The Nature of Cohesive Forces in Solids," referring to attempts that have been made to develop a kinetic theory of the solid state analogous to that developed for the gaseous state, and giving the conclusions drawn from this theory regarding the forces of attraction and repulsion between atoms. The lecture will be held at 4 o'clock on Wednesday afternoon, June 26. Doctor Dushman



has long been associated with studies of the atomic and crystal structure of metals. He was a lecturer at the University of Toronto before joining the research staff of the General Electric Co. in 1912. His principal work has been in connection with the photoelectric cell, electronics, atomic structure, the quantum theory, electron emission, unimolecular reactions. He is author of a paper on "High Vacuum," and of a chapter on "Quantum Theory" in Taylor's "Treatise on Physical Chemistry."

Nominations for Officers

The following nominations for officers are announced:

For President:

T. D. Lynch, Consulting Metallurgical Engineer, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

For Vice President:

F. O. Clements, Technical Director, Research Laboratories, General Motors Corp., Detroit, Mich.

For Members of Executive Committee:

G. B. Haven, Professor of Machine Design, in Charge of Textile Laboratory, Massachusetts Inst. of Technology, Cambridge, Mass.

C. R. Hook, Vice-President and General Manager, American Rolling Mills Co., Middletown, Ohio.

H. E. Smith, Engineer of Materials, New York Central Lines, New York City.

G. E. Warren, Assistant General Manager, Portland Cement Assn., Chicago, Ill.

These nominations were made by the Nominating Committee, consisting of W. H. Fulweiler, J. H. Gibboney and H. F. Moore (serving *ex-officio*); E. D. Boyer, J. J. Shuman, G. H. Clamer, Prévost Hubbard, M. E. McDonnell and R. L. Hallett.

Each of the above nominees has indicated in writing his acceptance of his nomination. The By-laws provide that "further nominations, signed by at least 25 members, may be submitted to the Secretary-Treasurer in writing by May 20, and a nomination so made, if accepted by the member nominated, shall be placed on the official ballot" which "shall be issued to the members between May 20 and June 1."

American Petroleum Institute Adopts A.S.T.M. Standards

The American Petroleum Institute has adopted as A.P.I. Standard all of the A.S.T.M. standard methods of test for petroleum products developed by Committee D-2 on Petroleum Products and Lubricants, with which committee the Petroleum Institute has long been cooperating. For many years leading petroleum companies and the Methods of Test Committee of the Institute have strongly advocated the adoption of the A.S.T.M. methods by the entire industry and they have been instrumental in giving wide distribution to the annual compilation of the Society's methods of tests for petroleum products. The formal adoption of these methods by the A.P.I. is a further step in the country-wide adoption of these methods.

A plan is being discussed with the officials of the Institute whereby the fact of the adoption of these methods as A.P.I. standard will hereafter be noted in the official A.S.T.M. printing of the standard, including the imprinting in a suitable manner of the A.P.I. standard number.

Committee C-4 on Clay and Cement Pipe

Committee C-4 on Clay and Cement-Concrete Pipe met at the Society's headquarters on April 3 for the primary purpose of putting into effect its plans for reorganization reported upon in the March BULLETIN. Two sub-committees have been formed. One will deal with specifications for clay pipe and will be under the chairmanship of J. F. Sanborn, Consulting Engineer, New York City. The second will deal with cement-concrete pipe and will be under the chairmanship of Asa E. Phillips, Consulting Engineer, Washington. The producers of clay pipe and of cement pipe will serve on the respective sub-committees and the consumer members of the committee have been assigned to one or the other of the two sub-committees.

An Advisory Committee is being formed to assume general direction of the affairs of the committee and will consist of the chairman, vice-chairman and secretary, the chairmen of the two sub-committees and one producer from each sub-committee. The Advisory Committee met April 24 under Mr. G. T. Hammond's chairmanship, and considered a number of matters of organization and policy incident to the beginning of the activities of the committee under this new set-up. The main committee will hold its next meeting during the coming annual meeting.

Sectional Committee on Plastering

A Sectional Committee on Specifications for Plastering, functioning under the American Standards Association, has been authorized by that body under the joint sponsorship of the Society and the American Institute of Architects. This sectional committee is to develop "specifications for lime, gypsum and cement plastering for interior work (not for exterior work or stucco)."

The personnel will include the representatives of the producers of plastering materials, lime, gypsum and cement, the producers of materials to which plasters are applied and representatives of consuming interests and those responsible for the execution of the work. The organization of the committee is now being effected.

Advertising in Index to A.S.T.M. Standards

The Executive Committee has decided to add an advertising section to the annual Index to A.S.T.M. Standards and Tentative Standards, the first issue of which was published last fall. Advertising of the following character is contemplated:

1. Advertisements by manufacturers and suppliers of engineering materials and products;
2. Advertisements by manufacturers and suppliers of testing machines, apparatus and equipment; and
3. Professional cards of consulting engineers, metallurgists, chemists, testing engineers and testing laboratories.

Advertising of the second and third types has appeared in the A.S.T.M. BULLETIN for the past three years; it has been recognized as a useful service to the members as well as to the advertisers, and at the same time has placed the BULLETIN practically on a self-sustaining basis. Present policies respecting BULLETIN advertising will be continued.

In so far as it may be necessary to limit the kind and extent of advertising in the Index, preference will be given to advertisements of materials and products covered by the A.S.T.M. specifications and methods of test.

Members and others interested in this new advertising policy may secure further information, including advertising rates, upon application to the Secretary-Treasurer.

Fatigue Tests at Elevated Temperatures

As mentioned in the 1928 report of the Joint Research Committee on Effect of Temperature on the Properties of Metals, its program includes making fatigue tests at elevated temperatures. Arrangements have now been completed by the sponsor bodies, the American Society of Mechanical Engineers and the Society, with the University of Illinois Engineering Experiment Station for carrying out these tests. The necessary funds have been subscribed by six manufacturers of steam turbines.

Research Fund Augmented by Chicago Local Committee

The Local Committee on Arrangements for the group committee meeting held in Chicago, after raising a fund for entertaining the members at the dinner held in conjunction with the group meeting, found that it had an unexpended balance of \$250. Rather than to refund this sum it voted to place it at the disposal of the Executive Committee. The Executive Committee, knowing that it would meet the wishes of the Local Committee on Arrangements, added this contribution to the A.S.T.M. Research Fund, with expression of its appreciation to the Local Committee. The fund now totals \$6250.

"Standards and Standardization"

The members will be interested in a new book by Norman F. Harriman, vice-chairman of the Federal Specifications Board, entitled, "Standards and Standardization." The book is termed a concise account of the more important elements of the science and art of industrial standardization. It is published by McGraw-Hill Book Co.

European Tour of the Foundrymen's Association

Itineraries for the European tour of the American Foundrymen's Association starting May 10, 1929, are now available. Those who may be interested are invited to correspond with C. E. Hoyt, Executive Secretary, 222 West Adams St., Chicago.

Chicago Group Committee Meeting

The annual spring group meeting of committees of the Society was held at The Stevens in Chicago, March 19 to 22. The committees met early and late, starting with sessions in the morning and extending through the afternoon and evening with but one break, a dinner and entertainment on Wednesday evening.

In all, 25 committees of the Society took part as indicated below, but with the many sub-committee meetings that were necessary the number of meetings held during these four days totalled 93: A-1 on Steel, A-2 on Wrought Iron, A-3 on Cast Iron, A-5 on Corrosion of Iron and Steel, A-6 on Magnetic Properties, A-7 on Malleable Castings, B-1 on Copper Wire, Sub-Committee VII, of B-2, on Methods of Chemical Analysis, Sub-Committee XIV, of B-2, on Silver and Gold Solders, Sub-Committee XV, of B-2, on Die-Cast Metals and Alloys, B-3 on Corrosion of Non-Ferrous Metals and Alloys, B-7 on Light Metals and Alloys, Sub-Committee II, of C-5, on Fire Tests of Lumber, C-7 on Lime, C-9 on Concrete and Concrete Aggregates, C-10 on Hollow Masonry Building Units, D-4 on Road and Paving Materials, D-5 on Coal and Coke, D-8 on Bituminous Waterproofing and Roofing Materials, D-11 on Rubber Products, Section, of E-1, on Coarse Screens, Research Committee on Fatigue of Metals, Research Committee on Yield Point of Structural Steel.

In addition meetings were held of the Sectional Committee on Wrought-Iron and Wrought-Steel Pipe and Tubing and of the Sectional Committee on Zinc Coating of Iron and Steel. The total number in attendance was 375.

Arrangements were made for members to visit one or more of the many places of interest, such as: Western Electric Co., Illinois Steel Co., Inland Steel Co., The Pullman Co., Commonwealth-Edison Co., Universal Cement Co., Portland Cement Assn. Laboratories, and International Harvester Co.

The success of this first meeting held as far west as Chicago was largely due to the efforts of the Local Committee on Arrangements, consisting of:

John Brunner, Chairman

M. A. Beeman	H. F. Gonnerman	F. R. McMillan
H. P. Bigler	C. E. Hoyt	H. H. Morgan
F. S. Crane	A. M. Johnson	G. S. Rutherford
E. H. Davidson	A. E. Lindau	L. W. Spring
R. G. Glass	L. S. Marsh	O. B. Zimmerman

The various actions taken at the meetings on recommendations to be made at the annual meeting on standards and tentative standards will appear in the annual reports of the committees and accordingly are not covered here in detail. Brief mention is made of some few features of the committee work as follows:

Committee A-1 on Steel.—Progress was reported on the determination of the yield point and elastic limit, being considered jointly by the Sub-Committees on Forgings and on Methods of Physical Tests.

The Sub-Committee on Forgings is recommending a change in the specified reduction from ingot to bloom from four to one to three to one.

The committee is recommending for advancement to standard, the specifications for carbon-steel castings for valves, flanges, and fittings for lap-welded and seamless steel pipe for high-temperature service, for structural steel for locomotives and cars, and the committee has also recommended for advancement to standard, tentative revisions of specifications for structural steel for bridges, for structural steel for buildings, for structural silicon steel, for welded and seamless steel pipe, and for lap-welded and seamless steel and lap-welded iron boiler tubes. The specifications for carbon-steel

forgings for locomotives have been completely revised and will be replaced by new tentative specifications. New tentative specifications for specially heat-treated helical springs have been accepted by the committee.

Committee A-2 on Wrought Iron approved certain revisions in the specifications for wrought-iron pipe and boiler tubes affecting the scope, form of bend test specimen, workmanship, threading, table of weights and the workmanship clauses. Revisions were recommended in the definition of a box pile and the requirement on reduction of area in the specifications for hollow rolled staybolt iron.

The Sub-Committee on Nomenclature and Definitions recommended a new definition for puddling of wrought iron.

The Sub-Committee on Methods of Chemical Analysis is continuing work in improving the method for the determination of slag in wrought iron and of developing a satisfactory method for the determination of phosphide phosphorus.

The Committee on Research has completed tests in the investigation to determine the effect of phosphorus in staybolt iron. Progress is being made on the important work of collecting correlating data on what constitutes quality in wrought iron.

Committee A-3 on Cast Iron.—The committee has approved new specifications for shelf stock valves and fittings as a tentative standard. The Sub-Committee on Heat Treatment of Cast Iron is preparing a digest of all literature published since 1908 on heat treatment of cast iron, which it expects to publish in 1930.

Committee A-5 on Corrosion of Iron and Steel.—The notable tests under the jurisdiction of this committee on the atmospheric corrosion of various groups of iron and steel sheets, have been concluded at the Pittsburgh and Fort Sheridan locations, but are still in progress at Annapolis. Tests are now in progress on the corrosion of various types of zinc-coated products, under atmospheric exposure conditions at Pittsburgh, State College, Pa., Altoona, Pa., Sandy Hook, N. J., and Key West, Fla. Zinc-coated wire, hardware, and other products are undergoing investigation in a similar way. Quick-time corrosion tests to serve as a measure of the value of materials in actual service are being studied. The important first step is a determination of the reliability of such tests as a yard stick. This is an important phase of the committee's activities, and substantial progress is being made.

The most recent phase of the committee's activities is the investigation of the corrosion of various materials in culvert service. Through cooperative effort established between the committees and highway and railroad organizations, a substantial beginning has been made, and there should be a steadily increasing fund of data and observation gathered, crystalized and made available in future publications of the Society.

Committee A-6 on Magnetic Properties is recommending the list of magnetic terms, definitions and symbols submitted last year for adoption as standard with certain minor revisions. Additional terms were suggested and referred to the Sub-Committee on Nomenclature and Definitions for consideration and recommendation.

Requirements for testing magnetic core materials at low inductions and commercial frequencies for use in current and audio frequency transformers were considered in some detail and it is expected that tentative methods of test will be ready for submission at the annual meeting.

Methods of testing magnetic materials such as magnet steels and the like with intense magnetic fields were discussed.

Committee B-1 on Copper Wire recommends that the tentative specifications for bronze trolley wire be advanced to standard. The committee in conjunction with the National Electric Light Association is making progress in the development of specifications for wire and cable for use in transmission lines for electric power. The committee is actively working in cooperation with the National Electrical Manu-

facturers Assn. and the American Mining Congress in the development of standards for trolley wire for use in mines.

Sub-Committee VII, of Committee B-2, on Methods of Chemical Analysis.—Cooperative analytical work in connection with the methods of analysis for silver solders has been completed. A tentative draft of the methods of analysis was discussed.

Work was actively started on methods of analysis for zinc-base die casting alloys. Standard samples are being prepared and will be cooperatively analyzed by various methods.

Sub-Committee XV, of Committee B-2, on Die Cast Metals and Alloys completed its arrangements for extensive corrosion tests at nine locations throughout the United States and the Panama Canal Zone, of various die-casting aluminum and zinc base alloys. These exposure tests will supplement the very complete mechanical, chemical, metallographic and X-ray studies of these alloys which have made such rapid progress during the last two years.

Outstanding developments of the committee's work to date include unusual showings for soundness of die-cast parts made with certain aluminum alloys as revealed by the X-ray examination and remarkable improvement in physical properties and stability of zinc-base alloys resulting from the use of special high-grade zincs.

Committee B-7 on Light Metals and Alloys, Cast and Wrought.—The tentative specifications covering aluminum-base sand-casting alloys in ingot form and aluminum-base alloy sand castings, respectively, are being extensively revised in order to bring them up to date and to include a number of new compositions.

A new Sub-Committee on Magnesium-Base Alloys is being organized and plans are under way for the drafting of specifications for magnesium-base casting alloys.

With some few minor revisions the tentative specifications for aluminum ingot for remelting and for aluminum sheet will be recommended for advancement to standard at the next annual meeting.

Sub-Committee II, of Committee C-5, on Fire Tests of Lumber.—The sub-committee is charged with developing standard test methods for fire-retardant treated lumber. Several series of tests desirable to cover the field fully were outlined by the committee and will be carried through before the June meeting of the Society.

Committee C-7 on Lime.—The project for establishing plastering specifications of national scope, under a Sectional Committee under the American Standards Association, to be sponsored by the American Society for Testing Materials and the American Institute of Architects, was discussed. It was decided to reorganize the existing Sub-Committee on Structural Lime to actively take up the investigation and experimental work in connection with finishing lime.

The Sub-Committee on Methods of Test of Lime and Lime Products is giving consideration to several modifications of the methods for determination of available lime and to a shorter method for determining soundness of limes for plastering purposes.

Committee C-9 on Concrete and Concrete Aggregates.—Revisions in a number of the existing tentative specifications are being prepared, including the revision of the standard method for making and storing specimens of concrete in the field, revised to include more adequate instructions for securing curing conditions more nearly comparable to those of the structure.

Work is being carried out on standard procedure for making specimens of concrete where large size aggregate is used; method of testing drilled cores as a basis for acceptance of concrete work; relation of abrasion test for slag to its concrete-making properties; relation of shape of particles of aggregate to their cross-bending and compressive strength, and the development of a method for measuring workability of concrete.

General subjects under consideration include measurement

of materials, mixing and placing of concrete; curing of concrete; measurement of volume changes in concrete; and conditions affecting the durability of concrete.

Committee C-10 on Hollow Masonry Building Units considered the substitution of the word "structural" for the word "hollow" in its specifications, and also the use of a capping material, for use in compression testing, composed of a mixture of sulfur and clay which would permit the testing of units immediately after the cap is placed and which would give ultimate strengths more nearly representative of the true strength of the material.

Committee D-4 on Road and Paving Materials approved for publication as tentative specifications for gravel for bituminous concrete base, and for portland cement concrete for pavement and for pavement base.

The committee took action to advance to standard the specifications for broken stone for bituminous macadam and for waterbound macadam surface course, a specification for sand for sheet asphalt and bituminous concrete pavements and method of test for the determination of moisture equivalent of sub-grade soils in the field. Two other specifications for broken stone were revised.

The revision in respect to the abrasion test requirements of the specifications for granite block were approved.

The present tentative specifications for natural or artificial sand-clay mixtures and the method of test for quantity of clay were withdrawn.

The committee received an interesting report on definitions relating to bituminous materials resulting from the conference which Mr. Hubbard had had with the British as the Society's representative. The definitions under discussion at that time had referred to a conference group of the Society's Committees D-2 on Petroleum Products, D-8 on Waterproofing Materials, and D-4 on Road Materials. The report of this conference group was approved.

Committee D-5 on Coal and Coke.—Arrangements were made for the continuation of cooperative sampling experiments to determine allowable tolerances when two or more samplers independently sample the same shipment of coal by the present A.S.T.M. standard method and by other methods involving the taking of smaller gross samples. From this data it is hoped to establish tolerances for different methods of sampling.

The Sub-Committee on Foundry Coke Specifications is making a survey of desirable characteristics, both chemical and physical, which influence the performance of the coke in the cupola.

Several tentative methods of test were recommended to the Society for publication as standard covering sulfur in coal, weight of coal and coke, sieve analysis and tumbler tests of coke. Two new tentative methods are being recommended for publication as tentative, covering tests for size and sieve analysis of coal.

Committee D-8 on Bituminous Waterproofing and Roofing Materials is recommending for publication as tentative new specifications for asphalt for built-up roofs.

Committee D-11 on Rubber Products.—The committee is cooperating with a committee of the American Chemical Society in studying physical test methods.

Considerable work is being carried out on flexure, abrasion and artificial life or aging tests.

The committee is also engaged in the preparation of specifications for rubber gloves for voltages not exceeding 8000 volts to ground.

Research Committee on Yield Point of Structural Steel.—An investigation is being carried out by the committee to ascertain the range of yield point in tension of structural specimens cut from common structural shapes, to determine the relationship between yield point and ultimate strength and to determine the proper location in shapes from which specimens should be cut in order to furnish reliable information on yield point, ultimate strength and ductility.

Foundry Coke Specifications

Sub-Committee VIII on Foundry Coke Specifications, of Committee D-5 on Coal and Coke, at a meeting held in conjunction with the Group Meeting in Chicago, went over at some length the question of revision of specifications for foundry coke. It was agreed that the new coke specification should be based on a contract statement as to the several properties of the coke to be specified, and that the specification should contain only the tolerances which would apply to these properties mentioned in the contract. The tolerances proposed are as follows:

Ash.—Five per cent of the specified ash content plus 0.25 per cent ash.

Sulfur.—Ten per cent of the specified sulfur content plus 0.05 per cent sulfur.

Volatile Matter.—Ten per cent of the specified volatile content plus 0.10 per cent volatile.

Shatter Test.—Tolerance of 5 per cent flat.

Moisture.—Limited to 3 per cent maximum in all cases, the samples being taken as loaded.

The matter of porosity and fineness was considered, but porosity was not believed by the committee to be of any special value in the specifications and it was not considered feasible to sample for fineness in the "as received" condition.

The combustion test was discussed at length and the committee is endeavoring to secure sufficient data on this test to justify including it in the specification as it seems to hold promise of considerable import in foundry coke testing.

To illustrate the working of the tolerances, a 10 per cent ash contract would allow a variation of 0.75 per cent ash, whereas a 7 per cent ash contract would allow only a variation of 0.60. A 1 per cent sulfur contract would allow a sulfur variation of 0.15, whereas 0.50 per cent sulfur contract would only permit a variation of 0.10.

The proposed tolerances are published in the sincere hope that all interested parties will submit criticisms to the committee, and especially as it is hoped that records of tests and corroborative service tests will be brought forth.

All communications regarding this proposed standard should be addressed to Mr. J. T. MacKenzie, Chairman of Sub-Committee VIII on Foundry Coke Specifications, American Cast Iron Pipe Co., 4300 Glenwood Ave., Birmingham, Ala.

Committee B-5 Organized

Committee B-5 on Copper and Copper Alloys, Cast and Wrought, made up of two sub-committees formerly under Committee B-2 on Non-Ferrous Metals and Alloys, as mentioned in the December issue of the BULLETIN, held a formal organization meeting in the Engineering Societies Building, New York City on February 19. C. H. Mathewson, Professor of Metallurgy, Yale University, was elected chairman and N. L. Mochel, Metallurgical Engineer, Westinghouse Electric and Manufacturing Co., Philadelphia, was elected secretary. W. R. Webster and N. K. B. Patch were continued as chairmen, respectively, of the Sub-Committee on Wrought Metals and Alloys and the Sub-Committee on Sand-Cast Metals and Alloys, formerly under Committee B-2.

The committee reviewed the status of the standards under its jurisdiction and is recommending the advancement to standard of the tentative revisions of the specifications for cartridge brass disks, cartridge brass, seamless admiralty condenser tubes, brass rod for use in screw machines, and for naval brass rods.

Coordinating Committee on Non-Ferrous Metals

The organization of the Coordinating Committee on Non-Ferrous Metals and Alloys referred to in the December issue of the BULLETIN has now been effected under the temporary chairmanship of W. H. Bassett, Technical Superintendent and Metallurgist, American Brass Co., and with C. H. Mathewson, Professor of Metallurgy, Yale University, serving as temporary secretary. This committee is to consist of two representatives of each of the standing committees dealing with subjects in the non-ferrous metals field, organized primarily as an outcome of the formation of three new committees of what were formerly sub-committees of Committee B-2 and the enlargement of the activities of Committee B-4 on High-Temperature and Electrical-Resistance Alloys.

In addition to handling all jurisdictional matters, it is proposed that this coordinating committee will guide and direct the activities of the Society in the whole non-ferrous metals field, initiating desirable projects and assigning them to the appropriate committees. This coordinating committee should also prove of invaluable assistance to Committee E-6 on Papers and Publications in the planning of programs of the annual meeting and arranging for discussions on important subjects dealing with non-ferrous metals.

Committee D-13 on Textile Materials

The spring meeting of Committee D-13 on Textile Materials was held in Boston on March 14 and in Lowell on March 15. The committee has before it the following problems: developing standard performance tests, such as tear and abrasion tests; the effect of changes in temperature and humidity on stretch in tire cord; checking the corrections of the 12-per-cent regain in raw wool; determination of sizing and loading; over-bleaching; proper removal of bleaching materials; fastness of dyes to light and water; and a suitable gage for gaging fabrics in accordance with the standard methods of the committee. It was suggested that the committee submit its standards to the various groups working with the American Standards Association for their approval before submitting them for approval by the A.S.A. The committee is recommending for advancement to standard the tentative specifications for 23/5/3 carded American tire cord and for certain light and medium fabrics. The committee is also proposing for adoption as tentative the specifications for 8, 9 $\frac{1}{4}$, 12 and 14-oz. chafar fabrics, and specifications for asbestos tape for electrical purposes.

The committee has continued its practice of having technical papers presented at its committee meetings. The following papers were presented:

- "What the Technical Man Can Do for the Cotton Industry," E. C. Morse;
- "Thoughts Regarding Stress-Strain Testing Machines," D. C. Scott;
- "Textile Engineering or the Training of the Textile Engineer and His Opportunities," Professor Ball.

Cooperation with N.E.L.A. on Rubber Gloves

The Society has been requested by the National Electric Light Association to prepare specifications for rubber gloves for voltages not exceeding 8000 volts to ground. These specifications are now being prepared by Committee D-11 on Rubber Products with the cooperation of the N.E.L.A.

New Members to April 27, 1929

The following 81 members were elected from March 2 to April 27, 1929, making the total membership, exclusive of student members, 4201.

Company Members (23)

Berkey & Gay Furniture Co., R. E. Prince
Brownell Co., The, C. B. Little
Callaway Mills, Inc., H. L. Marsh
Chapman Slate Co., R. D. Chapman
Compania Mexicana de Petroleo "El Aguila" S. A., R. M. Beesley
Downingtown Iron Works, A. C. Johnson
Electric Auto Lite Co., The, C. F. Gilchrist
Federated Metals Corp., Duquesne Reduction Branch, I. A. Simon
Filene's Sons Co., William, F. R. Carroll
Freeport Sulphur Co., T. J. Knapp
Grebe and Co., Inc., A. H., A. P. Montgomery
Hookless Fastener Co., W. L. Hanselman
Internat. Communications Labs., Inc., W. C. Peterman
Internat. Telephone and Telegraph Corp., E. D. Talbot
Louisiana Oil Refining Corp., F. J. Mechlin
Lunkenheimer Co., The, A. J. Jupp
McEverlast, Inc., L. S. Trainor
Monson Maine Slate Co., The, F. H. Rudy
National Alloy Steel Co., N. B. Ornitz
National Gypsum Co., N. D. Crandell
Ontario Research Foundation, O. W. Ellis
Sullivan Mining Co., W. G. Woolf
Ward Leonard Elec. Co., W. W. Miller

Individual and Other Members (51)

Archer, R. S. (Aluminum Co. of America)
Baird, R. O. (North Dakota State Food Commissioner and Chemist)
Bailey, E. M. (Scottish Oils, Ltd.)
Ball, H. J. (Lowell Textile Inst.)
Barrett, E. C. (Abraham & Straus, Inc.)
Bates, H. W. (Forest City Testing Lab. Co.)
Bogert, C. L. (Consulting Engr.)
Brown, G. G. (Univ. of Michigan)
Bush, T. B. (B. P. Bishop Estate)
Cassedy, W. F. (Internat. Communications Labs., Inc.)
Cincinnati Municipal Reference Bureau
Cone, E. F. (The Iron Age)
Daude, E. F. (Consulting Engr.)
Develin, R. G. (P. R. Co.)
Dowswell, H. R. (Shreve & Lamb)
Drury, F. E. (London County Council School of Building)
Eastlack, H. E. (E. I. du Pont de Nemours and Co.)
Elsby, L. F. (The Shell Co. of New Zealand, Ltd.)
Ensminger, G. R. (E. I. du Pont de Nemours and Co.)
Ernet, W. S. (Cumberland Portland Cement Co.)
Fogg, L. W. (Youngstown Sheet and Tube Co.)
Frear, C. L. (De Laval Separator Co.)
Hess, H. M. (Lawrence Portland Cement Co.)
Jacoby, C. E. (Clark E. Jacoby Eng. Co.)
Johnson, J. W. (Conard & Buzby)
Karlson, C. B. (Seamless Steel Equipment Corp.)
Linkert, H. W. (Wheeler-Schebler Carburetor Co.)
Longstreth, E. T. (Samuel H. French and Co.)
Lorand, Franz
Margerum, C. E. (U. S. Naval Gun Factory)
McLarn, E. S. (Internat. Telephone and Telegraph Corp.)
Miller, L. H. (Am. Inst. of Steel Constr.)
Morey, C. T. (Rhode Island Tool Co.)
Newhouse, E. L., Jr. (Am. Smelting and Refining Co.)
Newton, S. P. (The Sherwin Williams Co. of Canada)
Penteado, Cassio (Cia Nacional de Artefactos de Cobre "Conac")
Sanborn, J. M. (Consulting Engr.)
Scheller, Ernest (United States Foil Co.)
Shaw, J. B. (Pennsylvania State College)
Sheldon, H. C. (H. C. Sheldon Slate Co.)
Silver, B. R. (The New Jersey Zinc Co.)
Singer, W. A. (Apex Smelting Co.)
Snoke, H. R. (U. S. Bureau of Standards)
Stallings, W. L. (Agricola Furnace Co., Inc.)
Stein, I. M. (Leeds & Northrup Co.)
Stevens, K. K. (Carnegie Inst. of Tech.)
Tacoma City Engineer's Office
Walton, A. G. (Sand-Lime Brick Assn.)
Wheatley, C. W. (A. O. Smith Corp.)
Williams, F. N. (Simms Oil Co.)
Yeaw, J. S. (Rochester Gas and Elec. Corp.)

Junior Members (7)

Brightman, E. D.
Coughlin, F. T. (New York Power and Light Corp.)
Drought, F. T. (Lilly-Drought, Engrs.)
Elligers, Carl
McCormick, James (Connecticut River Development Co.)
Searcy, E. M. (Constr. Superintendent)
Suez, R. K. W. (Univ. of Mich.)

Personals

R. E. WILSON, head of the research department of the Standard Oil Co. of Indiana, has been appointed assistant to the vice-president in charge of manufacturing. In this capacity he will direct the new development and patent department of the company.

N. K. B. PATCH, secretary of the Lumen Bearing Co. of Buffalo, has recently been elected first vice-president of the American Foundrymen's Association.

W. H. WHITCOMB has recently joined the organization of the Henry L. Scott Co. of Providence, R. I. Mr. Whitcomb for the past twelve years had been director of the Central Laboratory in the Footwear Division of the U. S. Rubber Co., New Haven, Conn.

H. W. BATES, vice-president of the Forest City Testing Laboratory Co., will be in charge of the new branch office and laboratory established in Detroit, Mich.

* Announcement is made of the following appointments:

Dr. G. W. Thompson, Chief Chemist, National Lead Co., has been appointed to succeed Prof. H. F. Moore as a representative of the Society on the Engineering Division of the National Research Council.

Mr. P. E. McKinney, Metallurgical Engineer, Bethlehem Steel Co., Inc., has been appointed to succeed Mr. H. T. Morris as one of the Society's representatives on the Ferrous Metallurgical Committee Advisory to the Bureau of Standards.

Cooperation with A.S.C.E.

The structural division of the American Society of Civil Engineers is contemplating the preparation of a manual on engineering for which purpose three committees have been organized, (1) on masonry and reinforced concrete (2) on steel and (3) on timber. The Society has been invited to appoint representatives on these three committees and Mr. H. H. Quimby, Consulting Bridge Engineer, has accepted appointment on the committee on masonry, and Mr. A. W. Carpenter, Assistant Valuation Engineer of the New York Central Railroad, Engineering Department, has accepted appointment on the steel committee. The appointment of a representative on the committee on timber is still under advisement.

Cooperation with N.E.M.A. and A.E.R.A. on Trolley Wire

At the request of the National Electrical Manufacturers Association, Committee B-1 on Copper Wire, in cooperation with the American Electric Railway Association and the American Mining Congress is developing specifications for a new size of grooved trolley wire known as 610 grooved section. This material is for use in mines. The A.S.T.M. representatives on the conference group preparing these specifications are W. R. Webster, C. D. Gray, E. E. Legge and W. H. Bassett and the A.E.R.A. representatives are C. L. Hancock, W. J. Quinn, and H. S. Murphy. Mr. C. D. Beck will represent the N.E.M.A. and Mr. G. A. Haldeman the American Mining Congress.

Necrology

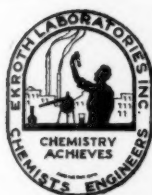
We announce with regret the death of three members and representatives:

ARTHUR H. ANNAN, Superintendent, Rhode Island Tool Co., Providence, R. I. Member since 1913.

W. CALDER, Chairman, Titles Office, Country Roads Board of Victoria, Melbourne, Australia.

JOB TUTHILL, Assistant Chief Engineer, Pere Marquette Railway, Detroit, Mich.

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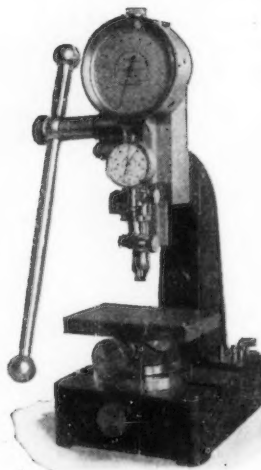
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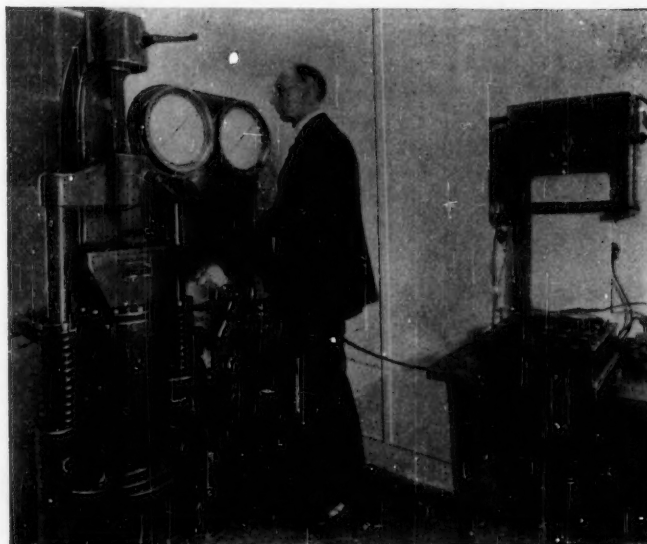
Two Electrical Achievements of the Year —

Development of the
**McCollum-Peters
Electric Telemeter**

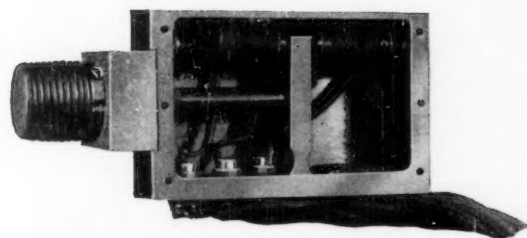
and the

**All Automatic Electric
Emery-Testing Machine**

*Both being demonstrated in the New
Model Laboratory at Southwark's Plant.*



**ALL AUTOMATIC ELECTRIC RECORDING
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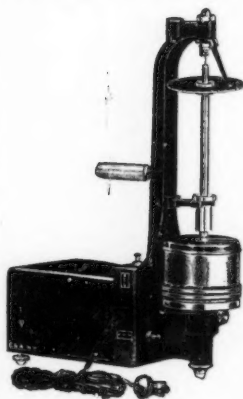
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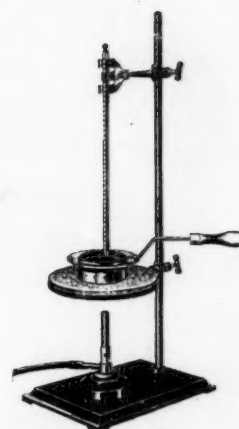
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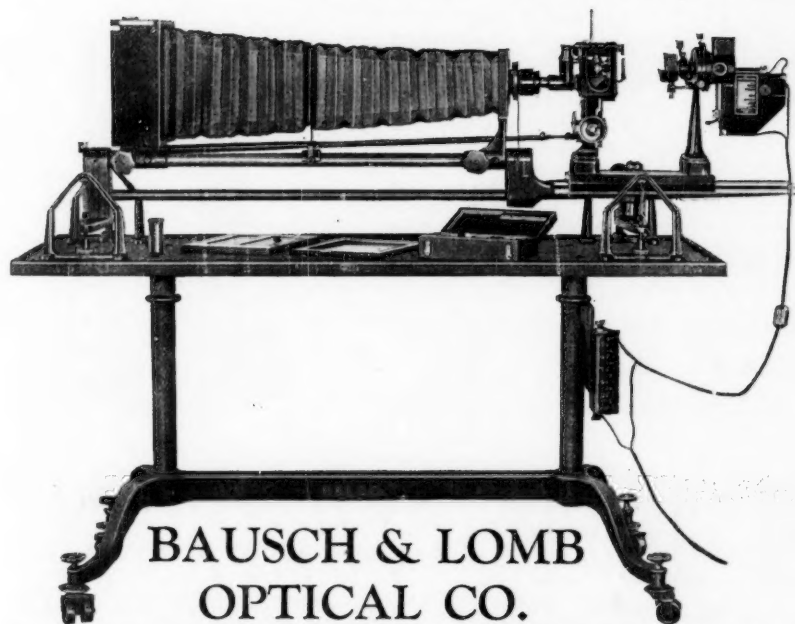


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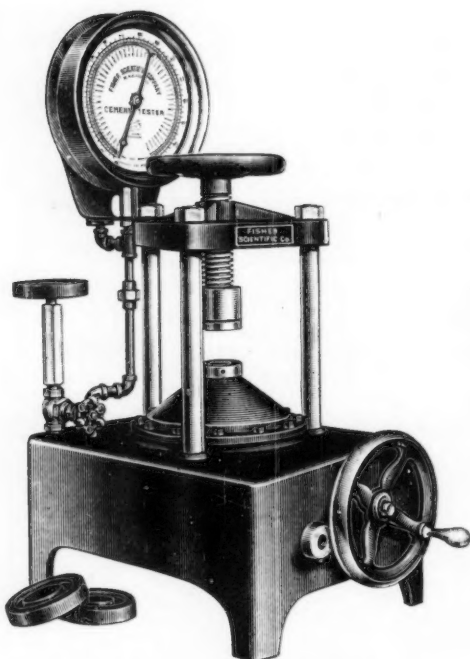
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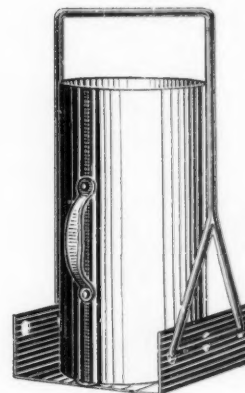
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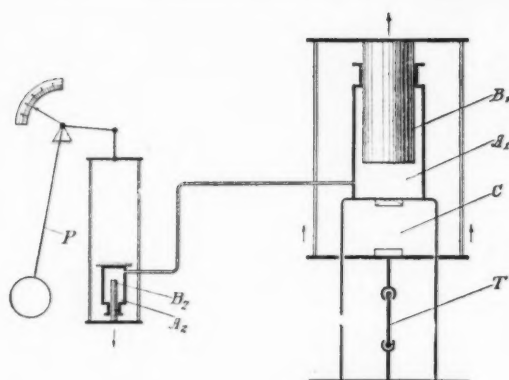


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